Trend Study 18-5-02

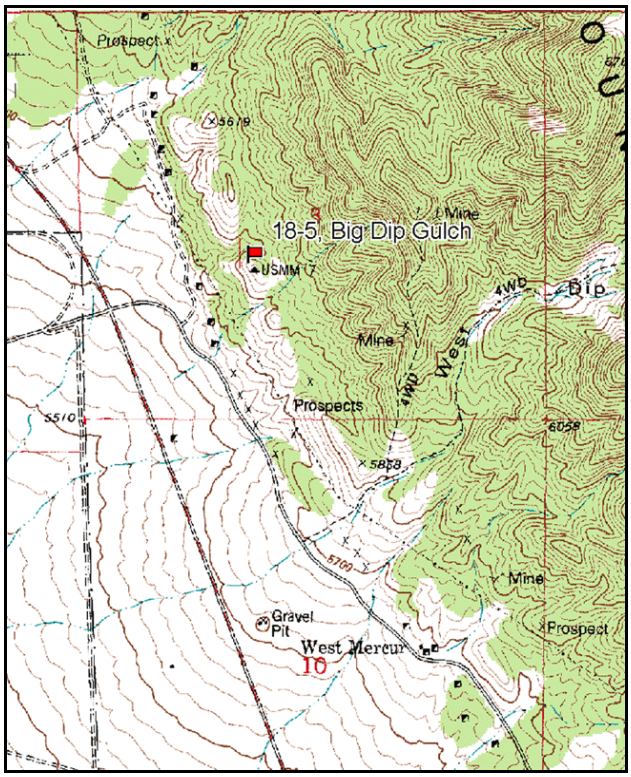
Study site name: Big Dip Gulch . Vegetation type: Black Sagebrush .

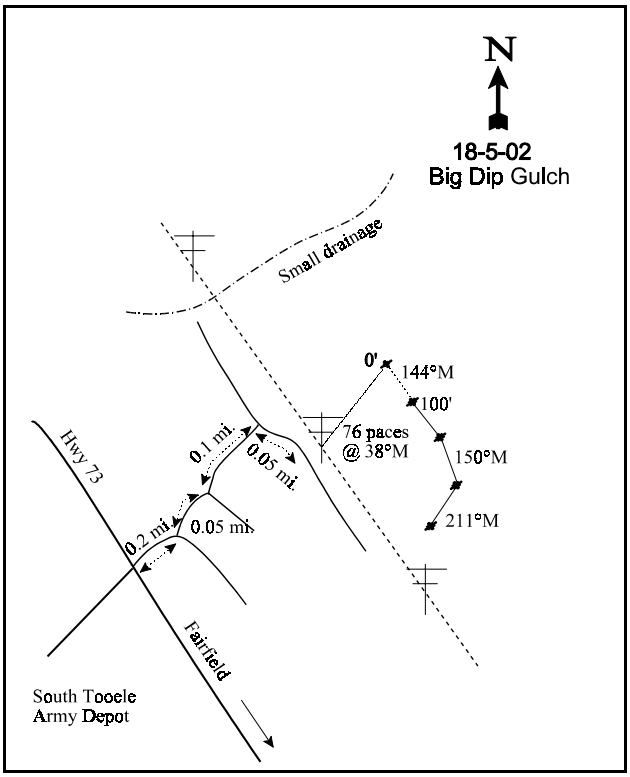
Compass bearing: frequency baseline 150 degrees magnetic. (Line 4 @ 211°M)

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the junction of Highway U-73 and the east entrance to the South Tooele Army Depot, turn east on the dirt road directly across from the depot entrance towards West Dip Gulch and travel 0.20 miles to an intersection. Turn left and travel 0.05 miles to another intersection. Turn left again and travel 0.10 miles to another intersection. Turn right and proceed 0.05 miles along a power line until you come to two power poles. The 0-foot mark of the frequency baseline is located 76 paces from the two power poles at an azimuth of 38 degrees magnetic. It is marked by a green steel fencepost 15 inches in height with a red browse tag, number 3969.





Map Name: Ophir

Diagrammatic Sketch

Township 6S , Range 4W , Section 3

GPS: NAD 27, UTM 12S 464542 N 391145 E

DISCUSSION

Big Dip Gulch - Trend Study No. 18-5

The Big Dip Gulch study is located on a black sagebrush hillside between Silverado Canyon and West Dip Gulch. Elevation of the site is 5,700 feet with a variable slope of 12% to 25% and a west aspect. The Bureau of Land Management manages this area. The range type is black sagebrush interspersed with an occasional cluster of Wyoming big sagebrush. The Wyoming big sagebrush occurs more commonly down slope. The herbaceous understory is noticeably lacking. The site is classified as critical deer winter range. It has shown evidence of domestic sheep use in the past. Deer use was moderately heavy in 1997 with a quadrat frequency of 42% for pellet groups. Deer use was lower in 2002 with a quadrat frequency of pellet groups at 22%. A pellet group transect read along the study baseline in 2002 estimated 44 deer days use/acre (109 ddu/ha).

Textural analysis indicates a clay loam soil containing abundant shale fragments with a mildly alkaline reaction (pH 7.5). Effective rooting depth is estimated at only about 6 inches with a soil temperature of 47°F at about 8 inches. The amount of phosphorus in the soil is quite low (4.9 ppm) and could be a limiting factor to plant growth and development. Drainage is poor and potential erodibility is severe. No litter or soil organic matter have accumulated in any significant amounts. Vegetation cover is limited to shrub crowns with the shrub interspaces being occupied by either erosion pavement or bare soil. The proportion of the cover contributed by rock and pavement has consistently been high at over 70% since 1983. The soil erosion condition class was determined as stable in 2002, due in part to the armored nature of the soil surface.

The majority of the browse forage comes from black sagebrush. They comprise a relatively uniform, low growing, and evenly spaced shrub community that initially had an estimated density of 9,532 plants/acre in 1983. Utilization was classified as heavy. Density was estimated at 5,640 plants/acre in 1997, with the much larger sample. Utilization was moderate and vigor was normal on most plants. Young recruitment was good with 16% of the population consisting of young plants. Decadent plants accounted for only 7% of the population in 1997. Density was estimated at just over 7,000 plants/acre in 2002 with a cover value of 8%. Use remained light to moderate. A few plants displayed heavy browsing. Vigor remained good but the number of decadent plants increased to 22% of the population. Other browse plants are incidental in occurrence and include broom snakeweed, narrowleaf low rabbitbrush, little leaf horsebrush, and a few widely scattered Utah juniper and Stansbury cliffrose. Broom snakeweed declined dramatically in density, due to drought, from 4,300 plants/acre in 1997 down to 580 in 2002.

Grasses and forbs occur infrequently and account for minimal forage production. Species composition is typical for this type of site. The more common grasses include bluebunch wheatgrass, bottlebrush squirreltail, and Sandberg bluegrass. Forbs are mostly low growing species such as rose pussytoes, Hoods phlox, and Douglas chaenactis.

1983 APPARENT TREND ASSESSMENT

Soil condition is poor and trend appears to declining. Excessive erosion must be controlled before any soil or vegetative improvement can occur. Vegetative trend appears stable. The key browse species, black sagebrush, is stable and totally dominates the site.

1989 TREND ASSESSMENT

The soil trend appears to be stable with only about 9% bare soil. However, most of the cover is from rock and pavement which together cover 71% of the soil surface. Even with the stable soil trend, it is still in very poor condition and relatively shallow. Browse trend is stable, yet the number of decadent sagebrush is a concern. The trend for the herbaceous species is slightly up with improvements in nested frequency for bluebunch wheatgrass and Sandberg bluegrass.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly up (4)

1997 TREND ASSESSMENT

Soil trend looks to be stable but in poor condition. Percent bare soil has decreased to about 2%. Herbaceous cover is lacking, so protection from high intensity summer storms is very limited. The trend for the herbaceous understory is down with significant nested frequency losses for bluebunch wheatgrass and Sandberg bluegrass. Annuals make up only 19% of the herbaceous understory. Browse trend is stable for black sagebrush with lower rates of decadence and utilization.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - down (1)

2002 TREND ASSESSMENT

Trend for soil is down slightly due to an increase in bare ground and a corresponding decline in the ratio of protective ground cover to bare ground (from 1:4.6 to 1:2.6). The erosion condition class was determined to be stable in 2002 due to the armored nature of the soil surface. Trend for black sagebrush is considered stable. Density has increased slightly but seedling and young recruitment have declined and the number of decadent plants has increased (7% to 22%). Trend for the herbaceous understory is slightly improved but still poor. Sum of nested frequency for perennial grasses has increased slightly and nested frequency of bluebunch wheatgrass increased significantly. In addition, nested frequency of cheatgrass declined significantly. Cover of perennial grasses increased from about 4% total cover in 1997 to 7%. Forbs remain uncommon and contribute little forage to the site.

TREND ASSESSMENT
soil - down slightly (2)
browse - stable (3)
herbaceous understory - up slightly (4)

HERBACEOUS TRENDS --
Herd unit 18 , Study no: 5

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron spicatum	$_{a}$49	$_{b}$119	$_{a}$74	$_{b}$100	25	51	32	41	2.37	4.19
G	Bromus tectorum (a)	-	-	$_{b}$192	$_{a}$77	-	-	62	33	.51	.21
G	Oryzopsis hymenoides	$_{a}$3	$_{b}$9	$_{ab}$5	$_{a}$3	1	7	2	1	.04	.03
G	Poa secunda	$_{a}$160	$_{b}$222	$_{a}$182	$_{a}$185	69	87	71	74	1.37	2.66
G	Sitanion hystrix	$_{ab}$4	$_{ab}$1	$_{a}$-	$_{b}$11	2	1	-	5	.00	.10
Total for Annual Grasses		0	0	192	77	0	0	62	33	0.50	0.21
Total for Perennial Grasses		216	351	261	299	97	146	105	121	3.80	7.00
Total for Grasses		216	351	453	376	97	146	167	154	4.31	7.21
F	Allium spp.	-	-	2	9	-	-	1	6	.00	.05
F	Antennaria rosea	1	-	-	-	1	-	-	-	-	-
F	Arabis spp.	-	-	3	3	-	-	1	1	.00	.00
F	Astragalus spp.	-	-	3	-	-	-	1	-	.00	-
F	Castilleja chromosa	-	2	-	-	-	1	-	-	-	-
F	Calochortus nuttallii	-	-	-	5	-	-	-	2	-	.01
F	Chaenactis douglasii	$_{ab}$11	$_{b}$22	$_{ab}$19	$_{a}$2	5	10	8	1	.04	.00
F	Cryptantha spp.	2	3	-	-	1	1	-	-	-	-
F	Cymopterus spp.	-	-	-	1	-	-	-	1	-	.00
F	Erodium cicutarium (a)	-	-	10	9	-	-	3	5	.01	.02
F	Eriogonum spp.	-	1	-	-	-	1	-	-	-	-
F	Lactuca serriola	-	6	-	-	-	2	-	-	-	-
F	Lygodesmia spinosa	7	-	-	-	2	-	-	-	-	-
F	Phlox hoodii	-	7	-	-	-	2	-	-	-	-
F	Ranunculus testiculatus (a)	-	-	$_{a}$134	$_{b}$172	-	-	47	62	.41	.51
Total for Annual Forbs		0	0	144	181	0	0	50	67	0.42	0.53
Total for Perennial Forbs		21	41	27	20	9	17	11	11	0.05	0.08
Total for Forbs		21	41	171	201	9	17	61	78	0.47	0.61

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 18 , Study no: 5

Type	Species	Strip Frequency '97	Strip Frequency '02	Average Cover % '97	Average Cover % '02
B	Artemisia nova	88	95	6.40	8.14
B	Chrysothamnus viscidiflorus stenophyllus	2	1	.01	.03
B	Cowania mexicana stansburiana	1	1	-	-
B	Gutierrezia sarothrae	50	21	2.73	.23
B	Juniperus osteosperma	1	1	-	.00
B	Opuntia spp.	1	1	-	-
B	Tetradymia glabrata	1	1	-	-
Total for Browse		144	121	9.15	8.40

Key Browse Annual Leader Growth
Herd unit 18 , Study no: 5

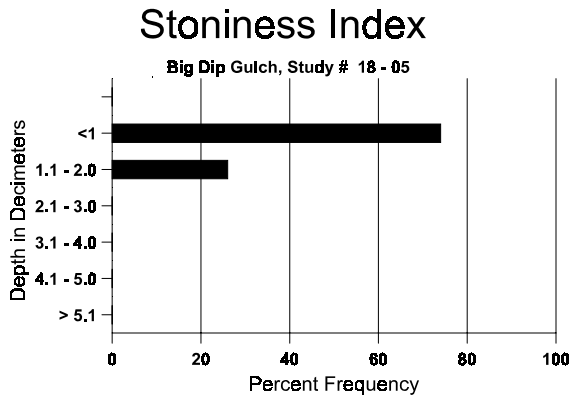
Species	Average leader growth (in) '02
Artemisia nova	1.4

BASIC COVER --
Herd unit 18 , Study no: 5

Cover Type	Nested Frequency '97	Nested Frequency '02	Average Cover % '83	Average Cover % '89	Average Cover % '97	Average Cover % '02
Vegetation	324	296	.75	10.00	13.81	15.10
Rock	331	342	16.25	33.00	25.22	32.12
Pavement	376	376	54.25	37.75	45.94	43.07
Litter	351	324	15.00	9.75	7.81	10.06
Cryptogams	187	112	0	.75	1.14	1.25
Bare Ground	186	278	13.75	8.75	2.12	9.68

SOIL ANALYSIS DATA --
Herd Unit 18, Study no: 5, Big Dip Gulch

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
5.9	46.8 (7.7)	7.5	28.0	39.4	32.6	2.8	4.9	195.2	0.5



PELLET GROUP FREQUENCY --
Herd unit 18 , Study no: 5

Type	Quadrat Frequency	
	'97	'02
Rabbit	9	15
Horse	1	-
Deer	42	22

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
02	02
-	-
-	-
574	44 (109)

BROWSE CHARACTERISTICS --
Herd unit 18 , Study no: 5

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia nova																		
S	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	89	25	-	-	-	-	-	-	-	-	25	-	-	-	1666			25
	97	17	-	-	-	-	-	-	-	-	17	-	-	-	340			17
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	83	-	18	34	-	-	-	-	-	-	51	-	1	-	3466			52
	89	24	11	-	-	-	-	-	-	-	35	-	-	-	2333			35
	97	36	8	-	-	-	-	-	-	-	44	-	-	-	880			44
	02	16	-	-	-	-	-	-	-	-	16	-	-	-	320			16
M	83	-	2	73	-	-	-	-	-	-	71	-	4	-	5000	8	14	75
	89	4	20	-	-	-	-	-	-	-	24	-	-	-	1600	7	15	24
	97	100	110	-	3	6	-	-	-	-	219	-	-	-	4380	20	21	219
	02	168	82	8	-	-	-	-	-	-	258	-	-	-	5160	8	17	258
D	83	-	-	16	-	-	-	-	-	-	10	-	5	1	1066			16
	89	32	45	-	-	-	-	-	-	-	77	-	-	-	5133			77
	97	7	11	-	1	-	-	-	-	-	6	-	-	13	380			19
	02	25	50	3	-	-	-	-	-	-	64	-	-	14	1560			78
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	420			21
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	14%	86%	08%	- 5%
'89	56%	00%	00%	-38%
'97	48%	00%	05%	+20%
'02	38%	03%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	9532	Dec:	11%
'89	9066		57%
'97	5640		7%
'02	7040		22%

Chrysothamnus viscidiflorus stenophyllus																		
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	-50%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	66	Dec:	-
'89	0		-
'97	40		-
'02	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cowania mexicana stansburiana																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	56	128	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	100%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:		-
'89	0			-
'97	20			-
'02	20			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	97	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	186	-	-	-	-	-	-	-	-	186	-	-	-	3720	7	9	186
	02	9	-	-	-	-	-	-	-	-	9	-	-	-	180	5	8	9
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	20	-	-	-	-	-	-	-	-	18	-	-	2	400			20
	02	11	-	-	-	-	-	4	-	-	4	-	-	11	300			15
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	200			10
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	3560			178

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	+97%
'97	00%	00%	.93%	-87%
'02	00%	00%	38%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	0	Dec:	0%
'89	133		0%
'97	4300		9%
'02	580		52%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	20		-
	'02	20		-

Opuntia spp.																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66	6	6	1
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	14	1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+ 0%
'89	00%	00%	00%	-70%
'97	00%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	66	Dec:	-
	'89	66		-
	'97	20		-
	'02	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Tetradymia glabrata																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	4	5	1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	10	11	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	20		-
	'02	20		-